

**PATENT ABSTRACTS OF JAPAN**

(11)Publication number : 08-102922

(43)Date of publication of application : 16.04.1996

---

**(51)Int.Cl.** H04N 7/025

H04N 7/03

H04N 7/035

---

**(21)Application number :** 06-259386 **(71)Applicant :** SONY CORP**(22)Date of filing :** 29.09.1994 **(72)Inventor :** YOSHINOBU HITOSHI  
YOSHIMURA TSUKASA  
HATTORI ZENJI

---

**(54) PROGRAM INFORMATION BROADCAST SYSTEM, PROGRAM INFORMATION  
DISPLAY METHOD AND RECEIVER****(57)Abstract:**

**PURPOSE:** To reduce the data quantity by including a signal representing a classification item and kind of each program being a component of program schedule information and its detail in terms of an ID and list data in cross reference with the ID to a broadcast signal and broadcasting the broadcast signal.

**CONSTITUTION:** Index data to be broadcast include a current time information packet 21, a channel assigning information packet 22, a program schedule information packet 23, an ID cross reference list data packet 24 and other packet 25. The content of each program scheduled to be broadcast is once displayed in terms of classification items and their detailed items, and the items are replaced with information expressed by the ID by using the cross reference list data. Then the program schedule information is reconfigured by each program information expressed by the ID and the result is broadcast as the packet 23. Furthermore, cross reference list data between each ID and data for character display of the classification items and detailed items corresponding to each ID are broadcast as the packet 24.

---

**LEGAL STATUS**

[Date of request for examination]	18.09.2001
[Date of sending the examiner's decision of rejection]	
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	3644455
[Date of registration]	10.02.2005
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

---

## CLAIMS

---

[Claim(s)]

[Claim 1] While two or more provisions of classification which consist of two or more thin items for recognizing the program element which constitutes the program itself and each program are prepared and said provisions of classification and a thin item express the content of each program Discernment data express these provisions of classification and a thin item, respectively, and program schedule information is generated. This program schedule information, The program information broadcasting format which broadcast the response tabular data of the data for carrying out character representation of said provisions of classification corresponding to said discernment data, and said thin item, and said discernment data.

[Claim 2] The program information broadcasting format according to claim 1 with which it comes to contain the information for recognizing the broadcast start time and broadcast end time for every program of each broadcast schedule in said program schedule information.

[Claim 3] The program information broadcasting format according to claim 1 with which it comes to contain in said program schedule information the information for recognizing the broadcast start time and broadcast end time for every program element unit which constitute the program of each broadcast schedule.

[Claim 4] The provisions of classification of plurality [ content / of the program of the broadcast schedule from the received broadcast wave signal ], The program schedule information that it was expressed by the thin item for every provisions of

classification, and these provisions of classification and a thin item were expressed by discernment data, respectively, The data for carrying out character representation of said provisions of classification corresponding to said discernment data, and said thin item, Response tabular data with said discernment data is extracted, and said said extracted response tabular data is used. Said discernment data of said said extracted program schedule information The program information-display approach characterized by displaying the program schedule which transposes to the corresponding data for carrying out character representation, generates program schedule tabular data, and carries out character representation of the content of a program of said broadcast schedule to a display based on this program schedule tabular data.

[Claim 5] The program information-display approach characterized by making it display on a display in the condition that the program equipped with the same thing as said provisions of classification or the thin item specified by the user as program information in the program information-display approach according to claim 4 is extracted from said program schedule information, and a user can recognize the extracted program concerned.

[Claim 6] The program information-display approach characterized by extracting the program element equipped with the same thing as said provisions of classification or the thin item specified by the user in the program information-display approach according to claim 4 from said program schedule information, generating the program schedule tabular data which consists only of the extracted program element concerned, and displaying the program schedule based on the program schedule tabular data concerned on a display.

[Claim 7] The program information-display approach according to claim 4 or 5 characterized by displaying the information about the broadcasting hours of the program in the mode which extracts the information for recognizing the broadcast start time and broadcast end time of a program of each broadcast schedule, and can discriminate not only broadcast start time but broadcast end time from said received broadcast wave signal corresponding to the program which corresponds in said program schedule, respectively.

[Claim 8] The program information-display approach characterized by extracting the information for recognizing the broadcast start time and broadcast end time of each program element of each broadcast schedule, and displaying the information about these broadcast start time and broadcast end time in said program schedule in the program information-display approach according to claim 5 corresponding to a program element, respectively from said received broadcast wave signal. [ of a program ]

[Claim 9] The provisions of classification of plurality [ content / of the program of the broadcast schedule from the received broadcast wave signal ], The program schedule information that it was expressed by the thin item for every provisions of

classification, and these provisions of classification and a thin item were expressed by discernment data, respectively, A program information extract means to extract the response tabular data of the data for carrying out character representation of said provisions of classification corresponding to said discernment data, and said thin item, and said discernment data, A program schedule tabular data generation means to transpose said discernment data of said program schedule information to the corresponding data for carrying out character representation using said response tabular data extracted with said program information extract means, and to generate program schedule tabular data, A receiving set equipped with a display-control means to display the program schedule based on the program schedule tabular data generated with said program schedule tabular data generation means on the display screen.

[Claim 10] In a receiving set according to claim 9, the key input means for carrying out selection assignment of said provisions of classification and thin item is established. Said program schedule tabular data generation means According to selection assignment with said key input means, a program or a program element equipped with the same thing as the provisions of classification or the thin item by which selection assignment was carried out is extracted from said program schedule information. It is the receiving set characterized by performing the display based on [ generate the indicative data which changes the extracted program or program element concerned into the condition that a user can recognize, and ] this indicative data in said display-control means.

[Claim 11] Said program information extract means has the function to also extract the time information about the broadcast schedule time of day of each program of a broadcast schedule. Said key input means It has the key input section for specifying the program for which a user wishes with reference to the program schedule displayed on the display screen, and a program element. The time information concerning said extracted broadcast schedule time of day in the program or program element specified by said key input section is used. The receiving set according to claim 9 or 10 characterized by having the control means which is made to make receiving selection to the broadcast predetermined time of the program concerned or a program element.

[Claim 12] The receiving set with which the program or program element contained the record regenerative-apparatus section, was specified by said key input section in the receiving set according to claim 11, and receiving selection was made [ the element ] to said broadcast predetermined time by the control means is characterized by what is recorded on said record regenerative-apparatus section.

[Claim 13] In a receiving set according to claim 12 said record regenerative-apparatus section It is what records the information about the recorded content on record area where the main record data are another. While recording the input signal of the program in which was specified by said key input section and receiving selection was

made to broadcast schedule time of day by the control means, or a program element on the main record data area of a record medium by said record regenerative-apparatus section The receiving set characterized by establishing a record means to record the information about the recorded input signal concerned on record area other than said main record data area of said record medium, and a playback means to reproduce the information about said input signal from said record medium, and to make it display on the display screen.

[Claim 14] Said key input means is the receiving set according to claim 13 characterized by to have the key input section for choosing as arbitration the program or the program element unit which a user reproduces from said record medium with reference to the information about said recorded content which was displayed on said display screen , and to have the function which extracts the program or the program element unit chosen by said key input section from said record medium , and is reproduced .

[Claim 15] The receiving set characterized by having the function which it is possible to specify the playback sequence of the selected program or a program element unit, and reproduces said selected program or selected program element unit by said key input section in a receiving set according to claim 14 according to said specified playback sequence.

---

## DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to receiving sets, such as a program information broadcasting format which broadcasts the information on the element which constitutes the program of the information on the class of each program of a broadcast schedule, a performer, etc., the program information-display approach which receives the program information broadcast by this broadcasting format, and is displayed on a display screen, and a television set.

[0002]

[Description of the Prior Art] Usually, when a viewer views and listens to a program with receiving sets, such as a television set and a radio set, he gets to know the content of a program and its broadcast schedule time of day of a broadcast schedule with program schedules, such as a newspaper, and television / the radio column of a journal, and is trying to refer to it.

[0003] And in carrying out program reservation for reservation sound recording, timed recording, etc., it is made to carry out input setting out of the broadcast channel of

the broadcast schedule program indicated by said newspaper and journal, the broadcast schedule time of day, etc. For this reason, since there was no program schedule to refer to when there is neither a newspaper nor a journal at hand, program reservation alter operation was not able to be performed.

[0004] Partly from such a situation, enabling it to display a program schedule on the screen of a television set with the television set which in the case of television broadcasting carries out multiplex [ of the program schedule ] to a video signal, broadcasts it with alphabetic character multiplex system etc., and carries an alphabetic character multiplex decoder is performed, for example. Moreover, he is trying to broadcast the information on a program schedule in a predetermined channel in North America also in the digital health broadcast (for example, to refer to 3.14 (no.603) or 101 pages – journal “Nikkei electronics” 1994. 110 pages) by which broadcast was started.

[0005] In addition, in the method of transmitting the highly efficient teletext which sponsors the information program which made the alphabetic character the subject, in order to measure the facilities of the program retrieval by the receiving side The data (keyword table for searching the menu table of the program transmitted, and the program transmitted) used as the index for the retrieval of each program by the broadcasting station side transmitting with the information on the content of a program is also proposed (and it \*\* television institute technical report [ ] -- ITEJ Technical Report Vol.16.No.71pp.1 –6 and BCS' -- 92–38 (Oct .. 1992) --) pp.7 – 12 and BCS'92 – 38 (Oct .. 1992) reference.

[0006]

[Problem(s) to be Solved by the Invention] However, the menu table in the case of the index retrieval method used by the method of transmitting the above-mentioned highly efficient teletext is a thing only for retrieval, and there is little information as program information on a TV program or a radio program. And text is transmitted as it is and there are comparatively many amounts of data transmission.

[0007] Moreover, alphabetic character multiplex system and the program schedule broadcast when it is the method with which it is broadcast by another channel that a program schedule is a program like digital satellite broadcasting are almost the same as what is indicated by a conventional newspaper and a conventional journal, and he is trying to transmit the data of the program schedule concerned itself moreover.

[0008] for this reason, it was difficult to be alike, and for the transmission amount of data to increase dramatically in a case, and to fully transmit the information about the content of a detail of a program of everything but information indispensable as race card information, such as a broadcasting station name, a program name, and broadcast start time, with very many broadcast channels.

[0009] Moreover, if the information on the conventional program schedule mentioned above is, the information, for example, the music program, about the element which constitutes each program, even if it also has information, such as a singer name and a

music name The response of reserving all the programs on which a user needs to read the information for every program, for example, a certain singer appears in searching program elements, such as the singer name, music name, etc., etc. required time and effort dramatically, and was difficult.

[0010] Moreover, in program reservation, such as timed recording, it is necessary to input the broadcast start time obtained from the race card, and the guessed end time, and program reservation actuation is dramatically troublesome.

[0011] Moreover, in the conventional program schedule, the broadcast time of day displayed is only the start time of a broadcast schedule program, and, as for end time, the way only had guessing from the start time of the following program. Moreover and conventionally, at all, since there was no information about the broadcast time of day of the program element unit which constitutes each program, it was not able to extract and reserve only 1-several music of a music program, for example. Moreover, it was impossible to have performed reservation actuation in which all a certain singer's music records etc.

[0012] In view of the above point, this invention aims at offering the program information broadcasting format which can broadcast program information with comparatively small data volume, even if the number of broadcasting stations and the number of programs become abundant.

[0013] Moreover, it aims at offering the program information-display approach which displays a program schedule on a display screen using the program information broadcast with the program information broadcasting format of this invention.

[0014] Moreover, it aims at offering the receiving set which enabled it to perform program reservation easily using the program schedule tabular data displayed by the program information-display approach of this invention.

[0015]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the program information broadcasting format by this invention While two or more provisions of classification which consist of two or more thin items for recognizing the program element which constitutes the program itself and each program are prepared and said provisions of classification and a thin item express the content of each program Discernment data express these provisions of classification and a thin item, respectively, and program schedule information is generated. This program schedule information, It is characterized by broadcasting the response tabular data of said discernment data and the data for carrying out character representation of said provisions of classification corresponding to the discernment data, and said thin item.

[0016] Moreover, it is characterized by including the time information for recognizing the broadcast start time and broadcast end time for every element unit which constitute every broadcast schedule program and each broadcast schedule program in said program schedule information.

[0017] The provisions of classification of plurality [ content / of the program of the broadcast schedule from the broadcast wave signal which received the program information-display approach by this invention ], The program schedule information that it was expressed by the thin item for every provisions of classification, and these provisions of classification and a thin item were expressed by discernment data, respectively, Response tabular data with the data for carrying out character representation of said provisions of classification corresponding to said discernment data and its discernment data and said thin item is extracted. Said said extracted response tabular data is used. Said discernment data of said said extracted program schedule information It transposes to the corresponding data for carrying out character representation, program schedule tabular data is generated, and it is characterized by displaying the program schedule which carries out character representation of the content of a program of said broadcast schedule to a display based on this program schedule tabular data.

[0018] When said provisions of classification and thin item are specified by the user, the program equipped with the specified provisions of classification or a thin item as program information is extracted from said program schedule information, and it displays on a display in the condition that a user can recognize the extracted program concerned. The program schedule tabular data which consists only of the extracted program concerned is generated, and you may make it display the program schedule based on the program schedule tabular data concerned on a display.

[0019] The provisions of classification of plurality [ content / of the program of the broadcast schedule from the broadcast wave signal which received the receiving set by this invention ], The program schedule information that it was expressed by the thin item for every provisions of classification, and these provisions of classification and a thin item were expressed by discernment data, respectively, A program information extract means to extract response tabular data with the data for carrying out character representation of said provisions of classification corresponding to said discernment data and its discernment data, and said thin item, A program schedule tabular data generation means to transpose said discernment data of said program schedule information to the corresponding data for carrying out character representation using said response tabular data extracted with said program information extract means, and to generate program schedule tabular data, It is characterized by having a display-control means to display the program schedule based on the program schedule tabular data generated with said program schedule tabular data generation means on the display screen.

[0020] In the receiving set by this invention moreover, said program information extract means It has the function to also extract the time information about the broadcast schedule time of day of each program of a broadcast schedule. Said key input means While having the key input section for specifying the program for which a user wishes with reference to the program schedule displayed on the display screen,

and a program element It is characterized by having the control means which is made to make receiving selection of the program or program element specified by said key input section to the broadcast predetermined time of the program concerned or a program element using the time information about said extracted broadcast schedule time of day.

[0021] The receiving set by this invention contains the record regenerative-apparatus section 200. Furthermore, this record regenerative-apparatus section 200 It is what records the information about the recorded content on record area (UTOC area) where the main record data are another. While recording the input signal of the program in which was specified by said key input section and receiving selection was made to broadcast schedule time of day by the control means, or a program element on the main record data area of a record medium by said record regenerative-apparatus section It is characterized by having a record means to record the information about the recorded input signal concerned on record area other than said main record data area of said record medium, and a playback means to reproduce the information about said input signal from said record medium, and to make it display on the display screen.

[0022] moreover , said key input means be characterize by to have the key input section for choose as arbitration the program or the program element unit which a user reproduce from said record medium with reference to the information about said recorded content which be displayed on said display screen , and to be equip a receiving set with the function which extract the program or the program element unit chose by this key input section from said record medium , and reproduce it in the sequence which specified .

[0023]

[Function] In the program information broadcasting format by this invention While the combination of two or more provisions of classification and the thin item for every provisions of classification expresses the content of each program It is what expresses these provisions of classification and a thin item by discernment data, respectively, and makes them program schedule information. This program schedule information, Even if it adds the response tabular data of said discernment data and the data for carrying out character representation of said provisions of classification corresponding to the discernment data, and said thin item, amount of information decreases compared with the case where race card alphabetic data is transmitted as it is. When the number of broadcasting stations and the number of programs become abundant especially, the effectiveness of reduction in amount of information is remarkable.

[0024] It is easy to add the time information for recognizing the part and program end time whose amount of information decreased, or to broadcast program detailed information.

[0025] Since the response tabular data of discernment data and the data for carrying

out character representation of said provisions of classification and the thin item corresponding to the discernment data is always broadcast as program information, also when the program elements which constitute the class and program of a program decrease in number, it increases or it is changed, it is easy to correspond dynamically. For example, even if it is the same discernment data, it is made to correspond with a news program for the program information at a certain time, and it can be made to correspond with a film program for program information when [ a certain ] another about the class of program.

[0026] Since the information for recognizing the broadcast start time and broadcast end time for every element unit which constitute every broadcast schedule program and each broadcast schedule program is included in program schedule information, while also being able to know broadcast end time certainly per program, the broadcast start time and broadcast end time can be known for every element unit which constitutes a program.

[0027] In the program information-display approach by this invention, the program schedule tabular data which consists of discernment data is made and changed into the program schedule tabular data expressed by the data for carrying out character representation using the response tabular data of the program information broadcast by said program information broadcasting format, and it displays on a display. If selection assignment of provisions of classification and the thin item of a program is done by the user at this time, the program schedule of those specified provisions of classification, for example, a sports program, will be displayed on a display.

[0028] Moreover, selection assignment of the thin item, for example, a certain singer name, for recognizing the element which constitutes a program by the user is carried out, and at the time of \*\*\*, the program schedule about the program on which the singer appears is created, and it is displayed on a display. The time amount from broadcast start time and broadcast end time, or broadcast start time to broadcast termination can be displayed on these program schedule.

[0029] In the above program schedule, if a user makes program reservation selection of the program for which it wishes into this program schedule, or the program element, referring to this, with the receiving set by this invention, selection reception of that selected program and selected program element will be carried out from that broadcast start time to broadcast end time.

[0030] And when the receiving set contains the record regenerative-apparatus section, the program or program element by which selection reception was carried out is recorded on a record medium. At this time, the data about the recorded program or program element are recorded on record area other than the main record data area. And the data recorded on the another record area are reproduced, and the information about the main record data, for example, a program name, a singer name, etc., is displayed on a screen.

[0031] With reference to the information about the main record data displayed on this

screen, a user can change playback sequence regardless of record sequence, can be reincarnated, or can extract only a part and can be reincarnated.

[0032]

[Example]

[explanation of a program information broadcasting format] -- one example of the program information broadcasting format by this invention is explained first. This example is the case where this invention is applied to the digital satellite broadcasting by which broadcast was started in the U.S. At the conventional analog terrestrial broadcasting, since a frequency band is divided every 6MHz, for example and he was trying for one broadcasting station to correspond to one broadcast channel by using each crossover frequency band as a broadcast channel 1 to 1, selection reception of the program of a specific broadcasting station can be carried out by choosing one broadcast channel.

[0033] On the other hand, it sets to the digital satellite broadcasting of this example, and the concept of a channel (in this example, it is the same as a broadcasting station a response and the following) does not show the frequency band of specification [ the channel of a certain thing ]. This is for using a broadcast frequency band effectively.

[0034] That is, \*\*\*\*\* of the amount of information to broadcast is good, and if it is a program with few motions of a screen, in order to carry out the data compression of an image or the voice, to broadcast them with methods, such as MPEG1 or MPEG 2, in digital satellite broadcasting, and to broadcast this on the other hand in the case of intense images of a motion, such as a sports program, without lowering image quality, many amount of information is need. Then, when broadcasting a certain program, he is trying to use a broadcast frequency band effectively by changing the broadcasting frequency or the frequency group used according to the amount of information to broadcast. That is, it can broadcast by one frequency or one frequency group, and when amount of information is abundant, even if it is one program, it may be necessary to broadcast two or more programs using two or more frequency or two or more frequency groups, when there is little amount of information.

[0035] Since the operating condition of a broadcast wave is not fixed, he is trying for other broadcast wave frequencies or frequency groups to broadcast the information about how it is used to the channel as a broadcast signal of a certain specific frequency group to a channel in this way in digital satellite broadcasting. On these descriptions, this is called an index channel.

[0036] The part which drawing 1 shows the example of the data transmitted as a broadcast signal, and is surrounded as a continuous line is a data packet, respectively. Each packet is variable length, and data packets, such as channel quota information required for the channel selection mentioned later, are periodically transmitted so that 1 time may surely exist in a certain fixed time amount. Moreover, each packet has packet discernment data for identifying each packet at the head.

[0037] Drawing 1 A shows the main broadcast signal broadcast about one channel as

one broadcasting frequency or a frequency group. This main broadcast signal is constituted from the image data packet 11, the voice data packet 12, the program schedule information packet 13, the program attached information packet 14, and the other packets 15 by this example.

[0038] And the image data packet 11 consists of video datas compressed by compressed format, such as MPEG1 and MPEG 2. This one image data packet 11 surely exists in a fixed period. However, in the case of a music cleared channel, the image data packet 11 does not exist.

[0039] The voice data packet 12 consists of voice data compressed by compressed format, such as MPEG/audio. This one voice data packet 12 also surely exists in a fixed period.

[0040] The program schedule information packet 13 includes the program schedule information on a broadcast schedule by the channel concerned in this case. The information attached to programs, such as a program title of the program which is carrying out current broadcast by the channel concerned, broadcast start time, broadcast end time, and information for title broadcast, is included in the following program attached information packet 14.

[0041] Next, drawing 1 B shows the index data broadcast by the index channel. In this example, the current time information packet 21, the channel quota information packet 22, the program schedule information packet 23, the list data packet 24 corresponding to ID, and the other packets 25 are contained in this index data.

[0042] The current information information on the current time information packet 21 shows current time of day. However, since the broadcast range crosses to a wide area in the case of digital broadcasting which used the satellite, in view of time difference existing, criteria time of day is broadcast as this current time information from a broadcast side with an area.

[0043] And in the case of this example, the information which shows the area where that receiving set exists to a receiving set, for example, a zip code, (ZIP CODE) is set up. And in a receiving set, the current time in that area is computed by searching for the time difference from said criteria time of day of that area, and subtracting and adding to the criteria time of day which received this time difference based on the information which shows that area. And further, if the comparison with the time of day which this current time received or computed and internal timer (clock) show is performed the time of power-source ON, or a fixed period, for example and there is a gap of time of day, or if there is a time-of-day gap beyond an allowable error, it will be made to proofread time of day which an internal timer shows in a receiving set using the information on the current time received or computed.

[0044] A receiving set is the information referred to at the time of channel selection and a switch etc., and the channel quota information packet 22 is information which shows which program uses which carrier wave (a frequency or frequency group) how at the event.

[0045] The program schedule information packet 23 broadcast as an index channel is the program schedule information on all channels. The program schedule information on this packet 23 consists of program schedule tabular data not only including broadcasting hours or a title but the attached information on other. In a receiving set, a program schedule is created based on this program schedule tabular data, and it indicates by selection on the screen of a receiving set so that it may mention later.

[0046] Program schedule tabular data does not consist of the alphabetic data itself which should be displayed as a program schedule except for the information on broadcasting hours in this case, but is a broadcast side and is created as follows.

[0047] First, the provisions of classification which consist of two or more thin items, respectively as information for recognizing the program element which constitutes the program itself and each program are set up and prepared for a broadcast side. A kind and a thin item become [ provisions of classification ] the relation of the minor key very much. These provisions of classification and a thin item are changed according to the content of the program which it is going to broadcast. And discernment data (discernment data are called following ID) express these provisions of classification and a thin item, respectively, and the response tabular data of this discernment data and the data for carrying out character representation of said provisions of classification corresponding to that discernment data and said thin item is prepared.

[0048] At a broadcast side, the content of each program of the broadcast schedule which constitutes program schedule information is once expressed by above-mentioned provisions of classification and its above-mentioned thin item. And it transposes to what expressed these provisions of classification and thin items by ID altogether using the aforementioned response tabular data. And using each program information expressed by this ID, program schedule information is reconstituted and this is broadcast as a program schedule information packet 23 in index data.

[0049] Moreover, the response tabular data of each ID and the data for carrying out character representation of said provisions of classification corresponding to the ID and said thin item is broadcast as a list data packet 24 corresponding to ID.

[0050] The program schedule information broadcast as this index channel is the program schedule information on all channels. When the program other than the broadcast start time of each whole program and broadcast end time can divide this program schedule tabular data as time information for every program element which constitutes it, the broadcast start time and broadcast end time of that program element unit are contained. As an example of the program which can be divided, a music special program is mentioned, for example. That is, although a music special program constitutes one program on the whole, it is because it can divide in the unit of a musical piece.

[0051] Drawing 2 is an example of the program schedule tabular data of this program schedule information packet 23. As shown in drawing 2, the packet header PH containing the packet ID which shows that it is data of the program schedule

information packet 23 at the head of this program schedule tabular data is broadcast. The following packet size PS shows the die length of this whole packet 23. The various pointers PI follow the degree of a packet size PS. And after the various pointers PI, the program information group CH1 of the broadcasting station of the 1st channel, the program information group CH2 of the broadcasting station of the 2nd channel, --, the program information group CHn of the broadcasting station of the n-th channel are broadcast one by one.

[0052] Each of the program information groups CH1-CHn serves as the channel information header Hch from m program information (m is the integer of arbitration) (the program information 1 - program information m) PG. The channel information header Hch serves as text data of broadcasting station names, such as CNN and ABC, from a corresponding channel number etc.

[0053] the class of two or more provisions of classification which are set up beforehand and prepared as each program information PG was mentioned above with the information 51 on the program ID for identifying the program concerned, the program division flag 52, the information 53 on the broadcast start time ST, and the information 54 on the broadcast end time ED -- the information on the provisions of classification for classifying the program concerned selected from inside (expressed by ID.) It consists of a thin item 56 which expressed hereafter the thin item (chosen from what is beforehand prepared as this was also mentioned above) of 55 which calls the information on these provisions of classification the information on an item class, and each item kind of information 55 by ID. The program element with which the information 55 on an item class and its thin item ID 56 constitute the program concerned is information.

[0054] In the case of the usual programs, such as a film, a drama, and news, for example, it seems that the program division flag 52 consists of a 1-bit flag F, and it becomes one program unit within broadcasting hours (from broadcast start time to broadcast end time), it considers as flag F = [0], and as program information is shown in the upper right of drawing 2, it does not have the program sub information SB mentioned later.

[0055] And when it is a music unit and the program which can divide a program per singer like a music special program, for example while constituting one program on the whole as mentioned above, the program division flag F is made into F = [1], and the information about a division program unit is included in the program information PG. The program information PG at the lower right of drawing 2 is the example, and includes two or more program sub information SB.

[0056] The information 61 on a program sub ID that each program sub information SB has the almost same DS as the program information 51-56 on Maine, and is the identification information of each division sub program unit. It consists of a thin item ID over the information 62 on the broadcast start time ST of the division sub program unit concerned, the information 63 on the broadcast end time ED of the division sub

program unit concerned, the information 64 on two or more item classes for classifying the division sub program unit concerned, and each item kind of information 64. Usually, like the example of drawing, although a program division flag is not included in the program sub information SB, of course, it can also perform forming a program division flag in the program sub information SB, and enabling it to classify a program still more finely.

[0057] As information 55 and 64 on an item class, although two or more item classes of k arbitration numbers from the 1st item class to the k-th ( $k=1, 2, \dots$ ) item class can be set up about one program or one division program unit As mentioned above, the information on each item class is expressed by ID data (item class list data mentioned later) of the item class list table transmitted into the packet 24 of the chart data corresponding to ID rather than consists of text data.

[0058] Moreover, each of the information 55 on each item class or the thin item ID in every 64 is expressed by ID expressed by the list data (it mentions later about this example) corresponding to ID about the thin item for every item class concerned transmitted into the packet 24 of the chart data corresponding to ID.

[0059] As information 55 on the item class of program information on Maine, there are a program title, a subtitle, a program category, a star, a supporting actor, a guest star, a performer, a player, etc. Moreover, as an example of the information 64 on the item class of program sub information SB, besides the above-mentioned example, if it is the case of for example, a music special program, a performer (singer name), a musical piece name, an affiliation music company, etc. will be mentioned.

[0060] Usually, at least one of the item classes of program sub information SB is the same thing as one of the item classes 55 of program information on the Maine, and it carries out the role of the link when searching the item class of program sub information SB from the item class of program information on Maine.

[0061] In this example, the list data 24 corresponding to ID are considered as the configuration which consists of list data of two or more item classes, and ID list data corresponding to two or more item kinds concerned of each thin item, as shown in drawing 1 C. That is, let a head first be the header information 31 containing the identification information which shows that the packet concerned is the list data 24 corresponding to ID. After this header information 31, the list data 32 of various kinds of provisions-of-classification classes in the program schedule information currently broadcast as index data at that time continue, and the list data 33 corresponding to ID of the thin item for every item class - 36 - continue after that.

[0062] In the example of drawing 1 C, ID list data corresponding to a performer and the list data 36 are made [ the list data 33 / ID list data corresponding to a program title and the list data 34 ] into ID list data corresponding to a program category, and - for ID list data corresponding to a program subtitle, and the list data 35. In addition, according to the program of broadcast schedules, such as list data corresponding to musical piece name ID, and list data corresponding to license ID corresponding to an

affiliation music company, the list data corresponding to ID are a broadcast side, and a required thing is set up and they are broadcast each time.

[0063] Drawing 3 – drawing 8 show the example of each list data 32–36, and consist of the table header Htb, the size information SZ which shows the magnitude of the table, ID information 37, and text data 38 as an example of the data for character representation, respectively. The ID information 37 and text data 38 serve as information corresponding to reference.

[0064] The ID information 37 is expressed by this example by the hexadecimal code of 4 figures. Text data 38 is character code data like a graphic display, and size is adjustable. For this reason, the end code (expressed by \*\*n by a diagram) is surely inserted in the last of each text data 38. Moreover, [FFFF] is inserted in the last of each list data corresponding to ID as a table stopper (information which shows the last of a table).

[0065] Drawing 3 is the example of item class list data, and is the text data 38, such as “a title (TITLE)”, “a subtitle (SUB TITLE)”, and “a category (CATEGORY) etc.”, and data of a response table with the response ID 37. Either of the responses ID 37 of this item class list data will be described by the information 55 on the 1st – the k-th item class of the program information PG on drawing 2, and program sub information SB, and each of 64.

[0066] Drawing 4 is list data corresponding to ID about an item class “a title”, and the table header Htb is expressed with ID (= 0000) of the text data “a title (TITLE)” of the item class list data of drawing 3. And that response ID 37 is expressed as the text data of “the text data 38 of the thin item about an item class “a title”, for example, “today's news”, (Today'News), Coast to Coast”, and “Mr.Postman” in a table format, and this list data corresponding to title ID is constituted.

[0067] The item ID on the right of the item class made into the “title” the program information PG on drawing 2, the information 55 on the 1st – the n-th item class of program sub information SB, or among 64 is expressed by either of the responses ID 37 of this drawing 4. The information on the item class of the program information PG and program sub information SB and the above-mentioned relation with Item ID are the same about other item classes.

[0068] In addition, drawing 5 is the list data corresponding to ID about an item class “a subtitle”, and list data corresponding to ID [ as opposed to / drawing 6 / as opposed to / in the list data corresponding to ID about an item class “a performer”, and drawing 7 / the list data corresponding to ID about an item class “a program category” / an item class “a license” in drawing 8 ].

[0069] In the case of the example of the list data corresponding to program category ID shown in drawing 7, generally [ “news”, “a film (MOVIE) etc.”, etc. ] the double figures of a high order in the ID code of 4 figures are denominative, and this shows Oita of a category to it. And under the ID code, it becomes a minor key in the category of each Oita, and if double figures are the case of a concrete category

“news”, for example, the category of Oita, let them be “political news”, a “sports highlight show”, etc.

[0070] In addition, although the broadcast end time itself was broadcast, you may make it broadcast the broadcasting-hours length from broadcast start time as information for recognizing broadcast end time as information for recognizing broadcast end time in the program schedule tabular data of drawing 2.

[0071] The race card (program schedule) of a broadcast schedule is created, and it is made to display on a display screen in the program information-display approach by this invention by using the data of the program schedule information packet 23 which received the above broadcast signals and was broadcast as index data and which consisted of an ID code and broadcast time information, and the list data corresponding to ID of a packet 24.

[0072] Moreover, in the receiving set by this invention, while enforcing the aforementioned program information-display approach, receiving a broadcast signal, creating a program schedule and displaying on a display screen, it is made to perform program retrieval to which a viewer wants to view and listen, and reservation record (image transcription and sound recording) processing by using an aforementioned item class and its aforementioned thin item as the data for retrieval.

[0073] [explanation of the configuration of a receiving set] -- one example of the receiving set by this invention that performs the program information-display approach by this invention is explained below, referring to below drawing 9. Although a digital broadcast wave may be transmitted not only using a satellite but using an optical cable, the example explained below is an example in the case of the receiving set which receives the digital broadcast wave which used the satellite.

[0074] Drawing 9 is the external view of the receiving set 70 of this example, and the remote commander 90 for this receiving set 70. The receiving set 70 of this example contains the record regenerative-apparatus section. This record regenerative-apparatus section is considered as the configuration of the record regenerative apparatus which used the so-called mini disc as the record playback medium which is the example of the possible magneto-optic disk of over-writing in this example so that it may mention later. The receiving set 70 was slid to the lower part right corner of that screen 75D forward and backward, equips it with the disk loading section 230 which incorporates a disk in equipment or is ejected, and it is constituted so that desorption of the mini disc 201 may be carried out to this loading section 230.

[0075] Drawing 10 shows the example of a block configuration of the receiving set of this example. 71 is a satellite broadcasting service antenna and the digital broadcast wave which has a data configuration as shown in drawing 1 which received with this antenna 71 is supplied to the program selector 72. The program selector 72 extracts the image data packet and voice data packet of the channel specified by the user while it performs the so-called channel selection and extracts index data from a broadcast signal in response to the control signal from the system-control section

100 so that it may mention later.

[0076] The image data compressed by MPEG1 or the MPEG 2 method extracted by the program selector 72 are supplied to the image data decoding section 73, and decoding, data decompression processing, and interpolation processing are performed. The image data decoding section 74 outputs the output image data to the graphic display processing section 74 in the form of a frame image. The graphic display processing section 74 is written in the frame memory of built-in in this processing section 74 with the period to which the frame image was specified, and is outputted to CRT display 75 in a display and this example. In this way, the repeat display of the image of the program in which selection assignment was done by the user is carried out to the screen of CRT display 75.

[0077] Moreover, the voice data compressed in the form of MPEG/audio extracted by the program selector 72 is supplied to the voice data decoding section 76, decoding, data decompression processing, etc. are carried out, it is outputted in the form of a digital signal or an analog signal, a loudspeaker 78 is supplied through the voice output processing section 77, and program voice is reproduced. Although volume control, tone control, etc. are performed in the voice output processing section 77 in response to the control signal from the system-control section 100 according to volume control actuation of the user who leads a remote commander 90, and tone control actuation, D/A conversion is also performed when a sound signal is outputted in the form of a digital signal from the voice data decoding section 76.

[0078] The system-control section 100 is considered as the configuration of a microcomputer, and a system bus 101 is received. ROM103 in which fixed data, such as an image data for displaying CPU102, a program, a race card to perform, etc. and alphabetic character font data, are stored, The timer (clock) 108 is connected with RAM104 as volatile memory used for work areas, SRAM105 as nonvolatile memory for data to be held, and Video RAM 106 through I/O Port 107.

[0079] Moreover, if a user operates it to a remote commander 90, this remote commander 90 will be transmitted to remote control reception / decoding section 83 by using the remote control signal according to actuation of a user as infrared radiation. Remote control reception / decoding section 83 decodes the received remote control signal, and inputs it into the system-control section 100 through an I/O Port (not shown). The system-control section 100 interprets the inputted digital remote control signal, and it performs the program of ROM103 so that control according to remote control actuation of a user may be performed.

[0080] With a remote commander 90, when channel selection actuation (program selection actuation) is performed, an image data packet, a voice data packet, etc. of the channel are extracted.

[0081] In the extract of this data packet, the system-control section 100 recognizes which frequency or frequency group the channel chosen from the program selector 72 by the user with the remote commander 90 in the index data of an index channel with

reference to the channel quota information on reception and the channel quota information packet 22 is assigned, as mentioned above. And the system-control section 100 is controlled to choose the image data packet of the channel which are delivery and the program selector 72 and was specified as the program selector 72 by the user in the selection-control signal according to this recognition result, a voice data packet, etc.

[0082] Since that a sequential change was made [ that ] by the index channel according to the broadcast wave at that time is a fixed period and the quota information on the frequency or frequency group to a channel is broadcast as a channel quota information packet 22 as mentioned above, the system-control section 100 requests the demand of the data packet of index data from the program selector 72 a fixed period in this example. The program selector 72 will return the data packet of an index channel to the system-control section 100, if the demand from this system-control section 100 is received. Thereby, the system-control section 100 can always supervise assignment of the frequency or frequency group to a channel.

[0083] Similarly, the system-control section 100 performs the transfer request of the current time information 21 on an index channel, the program schedule information packet 23, and the chart data 24 corresponding to ID to the program selector 72 a fixed period, and the program selector 72 transmits a data packet with a demand to the system-control section 100 according to this demand.

[0084] The acquisition demand of the data packet of index data in addition, a fixed period It does not take out from the system-control section 100 to the program selector 72. Beforehand, by the program selector 72, when the information packet of the above-mentioned data packet 21 of an index channel - 24 grades is found So that this may be notified to the system-control section 100 (transfer) set up or Or you may make it notify the data packet which had the assignment found by then from the program selector 72 the fixed period to the system-control section 100 regardless of the demand of the system-control section 100.

[0085] And the receiving set 70 of this example is equipped with the record regenerative-apparatus section 200 as shown in drawing 10 . In this example, this record regenerative-apparatus section 200 is considered as the configuration of the record regenerative-apparatus section of the so-called mini disc which is the magneto-optic disk in which an account rec/play student is possible, as mentioned above.

[0086] The image data from the image data decoding section 73 are sent to image encoding / decoding section 81, and the system-control section 100 sends delivery and the voice data from the voice data decoding section 76 to voice encoding / decoding section 82, when record demand actuation to this record regenerative-apparatus section 200 is performed through a remote commander 90.

[0087] Image encoding / decoding section 81 encodes the image data from the image data decoding section 73 in the format recorded on the record regenerative-

apparatus section 200. In this example, in order to record on the aforementioned magneto-optic disk, it encodes to the data format of MPEG1.

[0088] Moreover, voice encoding / decoding section 82 encodes the voice data from the voice data decoding section 76 to the data of the format recorded on a mini disc. That is, the block which divided into two or more bands and was divided by the higher region and which consists of two or more samples (it is better to make a measurement size into the same number in each band) for every band is formed so that bandwidth may become large about voice data, orthogonal transformation is performed for every block of each band, multiplier data are obtained, and the approach of being made to perform bit assignment for every block based on this multiplier data is used. The data compression approach in this case is taking into consideration human being's audibility property over a sound, and a data compression can do it in high efficiency (refer to Japanese Patent Application No. No. 278207 [ one to ]). For example, the data compression of about 1/ of the voice data is carried out to 5.

[0089] Image encoding / decoding section 81 and voice encoding / decoding section 82 When the record regenerative-apparatus section 200 is made into a playback mode, it decodes, respectively in response to the fact that the playback image data and playback voice data from this record regenerative-apparatus section 200. Displaying the decoded playback image data on CRT display 75 through the graphic display processing section 74, the decoded playback voice data reproduces voice by the loudspeaker 78 through the speech processing section 77.

[0090] The example of a concrete configuration of the record regenerative-apparatus section 200 is shown in drawing 11 . In drawing 11 , 201 is a magneto-optic disk (mini disc). For protection against dust and blemish antisticking, in cartridge 201A, the mini disc 201 of this example contains with a diameter of 64mm disk 201B, and is constituted. Beforehand, although PURIGURUBU for optical spot control (for tracking control) is formed by disk 201B, especially, in the case of this example, it superimposes on the wobbling signal for tracking at this PURIGURUBU, and address data are absolutely recorded by it.

[0091] Disk 201B rotates with a spindle motor 202. A revolution of a spindle motor 202 is controlled by the servo control circuit 205, and it is controlled so that disk 201B rotates in the state of a constant linear velocity. The shutter is prepared in disk cartridge 201A, and a shutter will be opened, if disk cartridge 201A is laid on a disk wearing tray and equipment is loaded with it. And the magnetic head 203 for record counters the upper part of shutter opening of disk 201B, and it is arranged, and an optical pickup 204 counters the lower part of shutter opening of disk 201B, and it is arranged.

[0092] Migration control of the optical pickup 204 is carried out in the direction of a path of disk 201B by the delivery motor 206. Moreover, the focus and tracking control of an optical pickup 204 are made by the servo control circuit 205.

[0093] The system controller 210 built in the record regenerative-apparatus section 200 carries a microcomputer, is constituted, performed the communication link of control data, the data of UTOC mentioned later through the communication link interface 211 between the system controller sections 100, and has managed actuation of the equipment 200 whole.

[0094] The configuration of the signal system of the record regenerative-apparatus section 200 of the example of drawing 11 is devised so that a configuration can be simplified as much as possible by IC-ization. In addition, the mode switch is made to be carried out in each part by the mode change-over signal from a system controller in the time of record and playback.

[0095] It connects through an interface 220 and an image encoder / decoding section 81 and the voice encoder / decoding section 82, and the signal system of the record regenerative-apparatus section 200 exchange a record regenerative signal.

[0096] The record data inputted through the interface 220 are once stored in the buffer memory 222 controlled by this memory controller 221 through the memory controller 221. As for buffer memory 222, in the case of this example, 1M-4M bit DRAM is used for data volume.

[0097] From buffer memory 222, compressed data is read by one about 5 times the transfer rate of drawing speed one by one, and the memory controller 221 transmits the read data to data encoding / decoding circuit 223 of a sector structure, if the track jump by which the record location on disk 201B flies by oscillation etc. during record does not arise.

[0098] Moreover, when it detects that the track jump arose during record, the memory controller 221 suspends the data transfer to data encoding / decoding circuit 223, and accumulates the compressed data from an interface 220 in buffer memory 222. And when a record location is corrected, control it is made to resume the data transfer from buffer memory 222 to data encoding / decoding circuit 223 is performed.

[0099] Detection of whether the track jump arose can form a vibrometer in equipment, and can be performed by detecting whether the magnitude of an oscillation is what a track jump produces. Moreover, since address data are absolutely recorded on PURIGURUBU by disk 201B of this example as mentioned above, to it, those absolute address data can be read at the time of record, and a track jump can also be detected from that decoding output to it. Moreover, Orr of address data is absolutely taken with a vibrometer, and you may make it detect a track jump. In addition, when a track jump arises, Power of the laser beam for a magneto-optic recording is lowered, or be made to let Power be zero.

[0100] And correction of a record location when a track jump arises can be made using the aforementioned absolute address data. Moreover, the capacity which can accumulate the compressed data equivalent to a part for time amount after a track jump arises as data volume of the buffer memory 222 in this case so that I may be understood from \*\*\*\* until a record location is corrected correctly is the minimum

need. In this example, as a capacity of buffer memory 222, it has 1M-4 M bits as mentioned above, and this capacity is selected as what had allowances so that the aforementioned conditions might fully be satisfied.

[0101] Moreover, in this case, at the time of this record, at the time of normal actuation, the memory controller 221 performs memory control so that the data stored as much as possible in buffer memory 222 may decrease. That is, if it becomes more than the specified quantity as which the amount of data of buffer memory 222 was determined beforehand, the data of the specified quantity, for example, the data for 32 sectors (1 sector is a 1 CD-ROM sector (about 2 K bytes)), will be read from buffer memory 222, and memory control will be performed so that the write-in space more than the predetermined amount of data may always be secured.

[0102] Data encoding / decoding circuit 223 encodes the compressed data transmitted from buffer memory 222 to the data of the sector structure of CD-ROM. In addition, the data of 36 sectors containing the data for 32 sector are called a cluster below. Record playback is performed in this cluster unit so that it may mention later.

[0103] The output data of data encoding / decoding circuit 223 are supplied to EFM and CIRC encoding / decoding circuit 224. While performing coding processing for error detection correction to data in this circuit 224, in the modulation processing suitable for record, and this example, EFM (8-14 modulation) processing etc. is performed. In this example, ACIRC (Add-on Interleave+CIRC) which changed the interleave to CIRC (cross interleave Reed Solomon code) of CD is used for the sign for error detection correction.

[0104] Record data are intermittent data, and a total of four sectors for cluster connection (a linking sector is called below) are added before and after the data of 32 sector, and it considers as the record data of one cluster which consist of 36 sector. In addition, a circuit 223 and a circuit 224 can be constituted as one IC.

[0105] Thus, the formed record data are supplied to the magnetic head 203 for record through the head actuation circuit 225. Thereby, the field modulated by record data is impressed to disk 201B (magneto-optic disk). Moreover, the laser beam from an optical pickup 204 is irradiated by disk 201B.

[0106] The optical pickup 204 consists of an optic, photodetectors, etc., such as laser light sources, such as a laser diode, a collimator lens, an objective lens, a polarization beam splitter, and a cylindrical lens, and bigger fixed Power's than the time of playback laser beam is irradiated by the recording track at the time of this record. Data are recorded on disk 201B by heat magnetic recording by this optical exposure and the modulation field by the magnetic head 203. And both the magnetic head 203 and the optical pickup 204 synchronize, and they are constituted so that a disk 201 may meet radially and it can move.

[0107] Moreover, the output of an optical pickup 204 is supplied to an address decoder 227 through RF amplifier 226 at the time of this record, the absolute address

data by which wobble record is carried out are extracted by PURIGURUBU prepared along the track of disk 201B, and it is decoded. And the detected absolute address data are supplied to EFM and CIRC encoding / decoding circuit 224, are inserted into record data, and are recorded on a disk. Moreover, absolutely, address data are supplied to the system control circuit 210, and are used for recognition and position control of a record location.

[0108] Moreover, the signal from RF amplifier 226 is supplied to the servo control circuit 205, the control signal for the constant linear velocity servo of a spindle motor 202 is formed from the signal from PURIGURUBU of disk 201B, and speed control of the spindle motor 202 is carried out.

[0109] The record format on this disk 201B is shown in drawing 12. That is, the most inner circumference of disk 201B is made into lead-in groove area, and is made the UTOC (User Table Of Contents) area in which the writing about the content of record data is possible by the user following this. After this UTOC is made into a data area (Data area), and let the outermost periphery of a disk 201 be lead-out area.

[0110] He is trying to manage the data file which the segment allocation table information that the operating condition of the cluster group of the data area on a disk 201 was memorized was recorded on UTOC, and was recorded on the disk 201.

[0111] An entry is prepared in a segment allocation table for every file, respectively. As each entry "The file name (File Name)" which shows the name of each file as shown in drawing 12, "The attribute (Attribute)" which shows the attribute of each file, and "the date (Date)" which shows the record time of each file, "The head cluster (Start Cluster)" which shows the cluster of the head where each file is recorded, "The link pointer (Link pointer)" in which the entry of the following cluster is shown when not recorded on "the cluster length (Length)" who shows the data size of each file, and the cluster which the file followed is recorded, respectively.

[0112] Since there are a continuous file, i.e., the file which needs real-time processing, and a file which is discontinuous in time and does not need real-time processing as file recorded on a disk 201 in time, the flag (1 bit) for distinguishing it is contained in the information on an attribute. For example, it is shown that it is the file which a corresponding file follows in time when this flag is "1", and when a flag is "0", it is shown that a corresponding file is a discontinuous file in time.

[0113] With the flag of this attribute, in time, at the time [ \*\*\*\* ] of a file, it manages continuously so that data may not break off by approaches, such as interruption processing, and at the discontinuous time of a file, it manages so that access to magneto-optic-disk 201B may be completed by one R/W.

[0114] Next, the time of playback is explained. At the time of this playback, rotational-speed control of the same constant linear velocity as the time of record is carried out [ a spindle motor 202 ] for disk 201B by the servo control circuit 205 with the signal from PURIGURUBU like the time of record.

[0115] While detecting a focal error for example, by the astigmatism method and

detecting a tracking error for example, by the push pull method by detecting the reflected light of the laser beam to which the optical pickup 204 irradiated the object truck at the time of playback, the difference in the polarization angle (car angle of rotation) of the reflected light from the object truck is detected, and a playback RF signal is outputted.

[0116] The output of an optical pickup 204 is supplied to RF amplifier 226. RF amplifier 226 makes a regenerative signal binary, and supplies it to EFM and CIRC encoding / decoding circuit 224 while it extracts a focal error signal and a tracking error signal from the output of an optical pickup 204 and supplies them to the servo control circuit 205.

[0117] The servo control circuit 205 performs tracking control of the optical system of an optical pickup 204 so that a tracking error signal may become zero, while performing focal control of the optical system of an optical pickup 204 so that said focal error signal may become zero.

[0118] Moreover, the output of RF amplifier 226 is supplied to an address decoder 227, and in this address decoder 227, address data are absolutely extracted from PURIGURUBU and it is decoded. And address data are absolutely supplied to the system control circuit 210 through EFM and CIRC encoding / decoding circuit 224 from this decoder 227, and it is used for the disk radial playback position control of the optical pickup 204 by the servo control circuit 205. Moreover, the system control circuit 210 can be used in order that the address information of the sector unit extracted out of playback data may also manage the location on the recording track which the optical pickup 204 is scanning.

[0119] At the time of this playback, the compressed data by which reading appearance was carried out from disk 201B is written in buffer memory 222, reading appearance is carried out, and it is elongated so that it may mention later, but data read-out by the optical pickup 204 from [ from the difference in the transmission rate of both data ] disk 201B is intermittently performed so that the data stored in buffer memory 222 may not become below the specified quantity.

[0120] In EFM and CIRC encoding / decoding circuit 224, an EFM recovery is carried out and error correction processing of the signal supplied through RF amplifier 226 is carried out. The output of EFM and CIRC encoding / decoding circuit 224 is supplied to data encoding / decoding circuit 223 of a sector structure, solves the sector structure of a mini disc, and decodes it to the former data in the condition that data were compressed.

[0121] The output of data encoding / decoding circuit 223 is once memorized by buffer memory 222 through the memory controller 221. And if the track jump by which a playback location flies by oscillation etc. during playback does not arise, the memory controller 221 reads the data in the condition of having been compressed from the circuit 223, one by one with the one 5 times transfer rate [ about 1 / ] of this of drawing speed, and transmits the read data to image encoding / decoding section 81

and/or voice encoding / decoding section 82 through an interface 220.

[0122] In this case, at the time of normal actuation, the memory controller 221 performs memory control so that the predetermined data more than necessary minimum may be stored as much as possible in buffer memory 222. For example, if the amount of data of buffer memory 222 turns into below the specified quantity defined beforehand, an optical pickup 204 performs intermittent incorporation of the data from disk 201B, the data from data encoding / decoding circuit 223 will be written in, and memory control will be performed so that the read-out space more than the predetermined amount of data may always be secured.

[0123] It is reproduced in the record regenerative-apparatus section 200 as mentioned above, and the image data supplied to image encoding / decoding section 81 are this image encoding / decoding section 81, decoding corresponding to MPEG1 method, expanding processing, and interpolation processing are performed, CRT display 75 is supplied through the graphic display processing section 74, and an image is reproduced by that screen.

[0124] Moreover, decoding and data decompression processing are performed in voice encoding / decoding section 82, and the voice data reproduced in the record regenerative-apparatus section 200 is supplied to a loudspeaker 78 through the speech processing section 77, and is outputted as voice.

[0125] In the receiving set which carried out [explanation of program schedule display [ in a receiving set ] and program retrieval, and program reservation] \*\*\*\*, by actuation of a user's remote commander 90, channel selection, a mode switch of the record regenerative-apparatus section 200, etc. are performed, and also a program schedule is created based on the program schedule information and the list data corresponding to ID which are broadcast as index data, and it projects on the screen of CRT display 75. Moreover, selection assignment actuation with a user's remote commander 90 can perform program reservation of program retrieval of various modes, timed recording, etc. using the item class of large number which constitute program schedule information.

[0126] Various carbon buttons are prepared in the remote commander 90 so that the above function can be realized. Drawing 13 shows carbon button arrangement of an example of the remote commander 90 of this example. As for a power button, various manual operation buttons [ as opposed to / 92 / 93 / a function switch carbon button and / 94 / a joy stick carbon button and / as opposed to / in a menu button and 95 / a retrieval carbon button / the record regenerative-apparatus section 200 in 96 ], and 97, in drawing 13, 91 is [ a program reservation carbon button and 98 ] cancellation carbon buttons. In addition, 99 is the transmitting section of a remote control signal.

[0127] By moving this in the left, the right, and the eight slanting directions a top and the bottom, if the joy stick carbon button 93 can function as a joy stick, and can move freely the pointer cursor and directions mark which were displayed on the screen the left, the right, and aslant a top and the bottom and the depression of this

carbon button 93 is carried out, it will function as an en turbo tongue (decision carbon button).

[0128] Drawing 14 is the so-called functional block diagram having shown the function of the system-control section 100 at the time of performing a display and program retrieval of a program schedule as a block according to the demand of a user. The display action of a program schedule is explained first, referring to this functional block diagram.

[0129] If a user inputs the display demand of a program schedule by operating the menu button 94 and the joy stick carbon button 93 of a remote commander 90, the remote control signal of a display demand of this program schedule is sent out as infrared radiation from the remote control transmitting section 99. Remote control reception / decoding section 83 receives and decodes this remote control signal, and sends it to the control section 110 of drawing 14 . A control section 110 creates a program schedule as follows according to this remote control signal, and projects it to screen 75D.

[0130] That is, as mentioned above, from the program selector 72, corresponding to the demand, to the system-control section 100, it is a fixed period and index data are sent, the data (refer to program schedule tabular data of drawing 2 ) of the program schedule information packet 23 of the index data are stored in the program data storage section 111, and the data of the chart data packet 24 corresponding to ID are stored in the list data storage section 112 corresponding to ID, respectively.

[0131] A control section 110 will pass this to the indicative-data generation section 113, if the display demand of the aforementioned program schedule is received. At this time, with reference to the item class list data and the list data corresponding to ID for every item class which were memorized by the list data storage section 112 corresponding to ID and which were mentioned above, the program schedule tabular data which consists of ID of the program data storage section 111 is changed into the program schedule tabular data which consists of text data, and the indicative-data generation section 113 writes it in buffer memory (not shown).

[0132] And from the program schedule tabular data which consists of this text data, the indicative-data generation section 113 forms the indicative data of a program schedule using the character font currently beforehand prepared for ROM103 of the system-control section 100, or the information for race card creation, and sends it to the graphic display processing section 74. In this case, since many channels cannot be simultaneously displayed on one screen when displaying a program schedule in the magnitude which a user can read easily, some program schedules are displayed and a displayed part for one screen is sent to the graphic display processing section 74 from the system-control section 100.

[0133] Drawing 15 is an example for a display of the program schedule TBL displayed on screen 75D of CRT display 75 of a receiving set 70. In this case, in this program schedule TBL, since the display frame of the information about each program is

restricted, all the information on the thin item of two or more item classes of program information PG on each program shown in drawing 2 is not displayed as a program schedule.

[0134] For this reason, as a display item about each program of this kind of program schedule, directing only the item of a program title, a subtitle, a performer, etc. fixed is also considered. However, in this example, since it is a broadcast side, the 1st item class – k-th item class is specified, respectively and he is trying to broadcast it as program information PG and SB on program schedule tabular data, the content of a display of each program in the program schedule TBL can be determined in the various display modes which the maker of program schedule tabular data meant.

[0135] That is, the content of a program can be displayed in various display modes by displaying even the i-th item class which enters within the program display limit displayed one by one from the 1st item class of program information PG on Maine, for example on a program schedule.

[0136] For example, it can be made to be able to display in order of the category and a program title, or can be made to display [ in the case of the program of categories, such as a drama (Drama) and a film (Movie), ] in order of a title and an artist (performer) like “TOP 40/SYUMING, DREAMCOMES TRUE” in drawing 15 like “Drama Mr.Postman” in drawing 15 in the case of categories, such as a music program. Moreover, it can be specified that it uses information about the item class of sub program SB as the data for a display of a program schedule.

[0137] And since the provisions-of-classification class about the occasional program is broadcast, item classification list data can display the new program category on the program schedule TBL, even if a new program category comes out.

[0138] In drawing 15 , the longitudinal direction of the program schedule TBL displayed is time amount, and a lengthwise direction is a channel (broadcasting station). If the program schedule TBL which will be displayed if a user operates the joy stick carbon button 93 of a remote commander 90 to a longitudinal direction is scrolled in the direction of time amount and the joy stick carbon button 93 is operated to a cross direction, since the program schedule TBL will be scrolled in the direction of a channel, a user can know program planning [ to wish ] about a time zone and a broadcasting station from the program schedule TBL displayed on this display 75.

[0139] In addition, the data for retrieval when searching a program are a thing, and these item kinds of character representation and the character representation of the thin item are displayed on a screen as a retrieval item (search key) in the case of the retrieval so that data and Item ID of an item class may be mentioned later. That is, the information 55 and 64 on an item class and the data of an item 56 and ID 65 serve both as the data for a display, and the data for retrieval.

[0140] The example of the retrieval which used this program schedule TBL is explained referring to the functional block diagram of drawing 14 , drawing 16 , and the

example of a screen display of drawing 17 .

[0141] At this time, a user transmits a menu button 94 to push and remote control reception / decoding section 83 of a receiving set 70 while pushing the retrieval carbon button 95 of a remote commander 70. In response to this remote control signal, a control section 110 makes the system-control section 100 search mode, and tells the indicative-data generation section 113 and the retrieval section 114 about it. [0142] At this time, the indicative-data generation section 113 reads the item class list data (refer to drawing 3 ) of the list data storage section 112 corresponding to ID, changes the text data of all item classes into alphabetic character font data, generates the indicative data of an initial retrieval menu, and displays this on CRT display 75 through the graphic display processing section 74.

[0143] Consequently, as shown in screen 75D at drawing 16 A, the initial retrieval menu M1 which carried out character representation of the item class is displayed in piles on the program schedule TBL. The frame mark KS which surrounds character representation on this initial retrieval menu M1 changes that location, when the item location chosen by the user is shown and a user operates the joy stick carbon button 93 of a remote commander 90 to a cross direction. This processing is also performed in the indicative-data generation section 113. The example of drawing 16 A shows that "the performer (ARTIST)" of the item classes is chosen.

[0144] When a user determines this "a performer (ARTIST)" as a retrieval item, in the condition of drawing 16 A, the depression of the joy stick carbon button 93 of a remote commander 90 is carried out. Then, a control section 110 sends the control signal based on the remote control signal to the indicative-data generation section 113 and the retrieval section 114. The indicative-data generation section 113 tells the retrieval section 114 about the retrieval item (expressed by ID) used as the search key determined by the user.

[0145] The retrieval section 114 extracts the list data corresponding to ID of the retrieval item told from the indicative-data generation section 113 from the list data corresponding to ID memorized by the storage section 112, and passes it to the indicative-data generation section 113.

[0146] The indicative-data generation section 113 changes the text data of the received list data corresponding to ID into the indicative data which consists of alphabetic character font data, supplies it to CRT display 75 through the graphic display processing section 74, and displays it on the screen 75D as a menu M2.

[0147] Since the retrieval section 114 extracts the list data corresponding to performer ID using ID of "the performer (ARTIST)" of item class list data and passes them to the indicative-data generation section 113 in this example The indicative-data generation section 113 will generate all performers' character representation data contained in the list data corresponding to performer ID shown in drawing 6 , and as shown in drawing 16 B, it will display this performer's menu M2 on CRT display 75 through the graphic display processing section 74.

[0148] In the case of a specific item to view and listen, and this example, a user performs a performer's selection like the above-mentioned out of this menu M2 using the joy stick carbon button 93 of a remote commander 90. In a menu M2, it indicates selection assignment of which performer carried out by surrounding the selected performer's character representation by the frame mark KS.

[0149] If selection assignment of a specific performer is checked by said frame mark KS, a user will push the joy stick carbon button 93 of a remote commander 90, and will input decision. Then, in the case of the item by which selection assignment of delivery and the indicative-data generation section 113 was done by the user in the control signal based on that remote control signal at the indicative-data generation section 113 and the retrieval section 114, and this example, a control section 110 tells a performer (expressed with ID) at the retrieval section 114.

[0150] The retrieval section 114 searches the program which has that performer ID as a thin item ID of an item class by using as a search key the item ID (here the performer ID) in which selection assignment was done by this user. When there is program sub information SB, it searches similarly about the program sub information SB. When the program sub information SB exists, it can be detected in which time amount the performer by whom selection assignment was done appears in one program.

[0151] This result is reflected in a program schedule as shown in drawing 16 C. That is, the menus M1 and M2 for retrieval are eliminated from screen 75D. And the searched result is displayed so that a slash may be attached and shown in drawing 16 C. In this case, when there is no program sub information SB in the program of the searched result, monochrome inverse video and a foreground color are changed and the one frame whole [ AL ] with which that searched program is displayed is shown. Moreover, program sub information is in the program of the searched result, and in the program, only the time zone when the performer for retrieval appears is displayed like PT which attaches and shows a slash in drawing 16 C, and is shown.

[0152] Furthermore, the depression of the menu button 94 is again carried out, for example with a remote commander 90 to narrow down a retrieval program. Then, as shown in drawing 17 A, the initial retrieval menu M1 is again displayed in piles on the program schedule TBL. Then, a user operates the joy stick carbon button 93 of a remote commander 90, and does selection assignment of the item class which should be made a search key like \*\*\*\*. In drawing 17 A, a "category" is specified as a search key and determined.

[0153] Then, the retrieval section 114 extracts category ID list data from the list data storage section 112 corresponding to ID, and passes them to the indicative-data generation section 113. The indicative-data generation section 113 changes the text data of category ID list data into the indicative data of a character font, and as this is shown in screen 75D of CRT display 75 through the graphic display processing section 74 at drawing 17 B, it displays it as a menu M3.

[0154] A user does like \*\*\*\* selection assignment of the thin item which should be made a search key in this menu M3 using the joy stick carbon button 93 of a remote commander 90. And the joy stick carbon button 93 is pushed, and if the input which determines a search key is performed, in the program schedule BTL, about two or more programs required in pre-retrieval, the retrieval section 114 will search by using the selected thin item as a search key, and will tell the indicative-data generation section 113 about the retrieval result.

[0155] As a slash is attached and drawing 17 C shows only the program chosen by retrieval on the program schedule TBL, the indicative-data generation section 113 performs processing displayed [ change / monochrome inverse video and a foreground color ], while menus M1 and M2 process an indicative data so that it may eliminate from on a screen. Retrieval conditions can be compounded as mentioned above and program retrieval can be performed.

[0156] in this way, in reserving the program searched and acquired so that it may record on videotape or record in the record regenerative-apparatus section 200 When the number of programs of a retrieval result is plurality and reserves one of them A user operates the joy stick carbon button 93 of a remote commander 90, and after he does selection and decision actuation for the program which wants to reserve of the programs of the retrieval result currently displayed on screen 75D, he does the depression of the reservation carbon button 97. When there are two or more programs to reserve, after only the number of programs performs the program selection and decision actuation by the joy stick carbon button 93 continuously, the depression of the reservation carbon button 97 is carried out. Furthermore, in reserving all the programs (the case where a retrieval result is one program is included) of a retrieval result, after pushing a function button 92 and switching to the condition of all program reservation, it carries out the depression of the reservation carbon button 97 of a remote commander 90.

[0157] A control section 110 changes the program reservation memory 115 into the condition which can be written in while requesting it to transmit a retrieval result to the retrieval section 114 at the program reservation memory 115, if this remote control signal is received.

[0158] The retrieval section 114 writes the channel information on the program searched for by retrieval, and the information on broadcast start time and broadcast end time in the program reservation memory 115. Moreover, in the case of this example, the retrieval section 114 also writes the reserved program title (text data) in the program reservation memory 115. Then, a control section 110 changes the reservation activation section 116 into an actuation condition.

[0159] The reservation activation section 116 will send the activate request of reservation record, and the information currently stored in the memory 15, such as channel information on a reservation program, to a control section 110, if the comparison with the broadcast start time of a reservation program and the current

time of a timer 108 which were written in the program reservation memory 115 is performed and current time turns into broadcast start time of the program reservation memory 115.

[0160] A control section 110 starts the program of the reservation record in ROM103 in response to the activate request of the reservation record from the reservation activation section 116. That is, with reference to the channel quota information in index data, the information which selects the frequency or frequency group of a broadcast channel of a reservation program is generated, and it is sent to the program selector 72. Thereby, a receiving set 70 receives a reservation program. And the image data of the reservation program from the image data decoder section 73 and/or the voice data of the reservation program from the voice data decoder section 76 are supplied to the record regenerative-apparatus section 200 through encoding/decoding sections 81 and 82, respectively.

[0161] A control section 110 supplies the control signal which makes this a recording mode to the record regenerative-apparatus section 200 again. Consequently, in the record regenerative-apparatus section 200, as it mentioned above, image data and/or voice data are recorded on a disk 201.

[0162] At this time, the title of the program concerned by which reading appearance was carried out from the program reservation memory 115 is supplied to the record regenerative-apparatus section 200 through the reservation activation section 116 and a control section 110, as mentioned above, it has the recorder file information and relation of that program, and this program title is recorded on the UTOC area of disk 201B.

[0163] In addition, since the program attached information packet 14 is contained in the broadcast wave signal of the channel of the reserved program as shown in the above-mentioned drawing 1 A, and the information on a program title is broadcast by this packet 14, the program title of this program attached information packet can be recorded on UTOC mentioned above. Moreover, it is also possible to replace with a program title or to record other information, for example, a program category name, a performer name, etc. with a program title as information recorded on UTOC.

[0164] And in this example, the information on the broadcast end time of each reservation program is also memorized by the program reservation memory 115, and if it judges that the current time of the reservation activation section 116 of a timer 108 corresponded with the broadcast end time of program reservation memory, a control section 110 will be told about that. In response, a control section 110 sends the control signal which controls the record regenerative-apparatus section 200 from a record condition to a idle state to the system-control section 210 of the record regenerative-apparatus section 200. Therefore, the record regenerative-apparatus section 200 stops record with program termination.

[0165] In addition, as stated on the occasion of explanation of the packet 21 of the current time information included in the index data of a broadcast signal, since, as for

the timer 108 of a receiving set 70, proofreading of time of day is performed by the current time information in said index data, a user does not need to perform time correction of a timer 108.

[0166] That is, the zip code (ZIP CODE) is registered into SRAM105 of the system controller section 100 as information which shows the area where the receiving set 70 exists. A user sets up the information which shows this area, or a dealer and a serviceman register it into SRAM105. As information which shows an area, the area code of the telephone number etc. can be used instead of a zip code.

[0167] And in the system controller section 100 of a receiving set 70, the current time information on a packet 21 is taken out from among the index data extracted from the input signal. It is broadcast as criteria time of day that this current time information was mentioned above, and it computes the current time in that area by the system controller section 100 searching for the time difference from said criteria time of day of that area, and subtracting and adding it to the criteria time of day which received this time difference based on the information which shows that area of SRAM105. And if the comparison with the time of day which this current time received or computed and internal timer (clock) shows is performed the time of power-source ON, or a fixed period, for example and there is a gap of time of day, or if there is a time-of-day gap beyond an allowable error, it will be made to proofread time of day which a timer 108 shows using the information on the current time received or computed.

[0168] In addition, in this example, when two or more programs with duplication of broadcasting hours are specified as a reservation program, the one where broadcast start time is earlier is recorded preferentially and record of that program is completed, between the broadcasting hours of that remainder records other duplication programs.

[0169] By actuation only by only choosing a search key as mentioned above, and specifying, even if a user does not know the information on broadcasting hours, such as broadcast start time of a program to reserve or a division sub program, he can reserve a program, and he can do timed recording and reservation sound recording.

[0170] Although it is an example at the time of being made to perform program retrieval using the program schedule TBL, as the above is explained below, it can search a sub program unit to program retrieval and a pan regardless of the program schedule TBL. And in the case of this retrieval, the program schedule of the narrowed-down division sub program unit according to a retrieval item can be displayed on a display screen.

[0171] That is, drawing 18 and drawing 19 are drawings for explaining the search method, respectively, and are drawing showing the example of a retrieval screen. Also in this example, the processing in the system-control section 100 explains the example of drawing 18 first, also referring to this drawing 14, since it can express with the functional block diagram shown in drawing 14.

[0172] In this example, if a user pushes the retrieval carbon button 95 of a remote

commander 90 and does the depression of the menu button 94 further, the carrier beam control section 110 will send a control signal for that remote control signal from a remote commander 90 to the indicative-data generation section 113. Then, the indicative-data generation section 113 generates the indicative data of the item class chart M4 equal to the initial retrieval menu M1 mentioned above with reference to the program schedule tabular data of the storage section 111, and the list data corresponding to ID of the storage section 112, and sends this to CRT display 75 through the graphic display processing section 74. Thereby, as shown in drawing 18 A, the item class chart M4 is displayed on screen 75D.

[0173] A user can operate the joy stick carbon button 93 of a remote commander 90, and can do selection assignment of the item class used as a search key from among this item class chart M4. On a screen, for example, monochrome inverse video and a foreground color are changed, and the item class by which selection assignment was carried out is shown. This processing is also performed in the indicative-data generation section 113. In drawing 18 A, it is in the condition that the item class by which selection assignment was carried out attaches a slash, and is shown, and selection assignment of "the category (CATEGORY)" is carried out.

[0174] The joy stick carbon button 93 of a remote commander 90 is pushed by the user, and if it opts for selection assignment of the item class used as a search key, the retrieval section 114 will be told about the item class as which the indicative-data generation section 113 was determined by the user with the control signal from the carrier beam control section 110 in the remote control signal and which should be searched.

[0175] The retrieval section 114 extracts the told item kind of list data corresponding to ID from the list data corresponding to ID memorized by the storage section 112, and passes it to the indicative-data generation section 113. The indicative-data generation section 113 changes the text data of the list data corresponding to ID into the indicative data which consists of alphabetic character font data, supplies it to CRT display 75 through the graphic display processing section 74, and displays it on the screen 75D as a menu M5. In this example, the list data corresponding to ID of a category are passed to the indicative-data generation section 113, and as shown in drawing 18 B, the chart of a category is displayed on screen 75D as a menu M5.

[0176] In the case of a specific item to view and listen, and this example, a user performs selection of a category like the above-mentioned out of this menu M5 using the joy stick carbon button 93 of a remote commander 90. Like the above-mentioned, monochrome inverse video and a foreground color are changed and the selected category is shown by processing of the indicative-data generation section 113. "The stock market (STOCKMARKET)" is selected in the example of drawing 18 B.

[0177] If a user pushes the joy stick carbon button 93 of a remote commander 90 and inputs decision in this condition, a control section 110 will tell the retrieval section 114 about ID of the item by which delivery and the indicative-data generation section

113 were determined as the indicative-data generation section 113 and the retrieval section 114 by the user in the control signal based on that remote control signal.

[0178] The retrieval section 114 performs program retrieval about the program schedule tabular data of the storage section 111 by using this told item ID as a search key. If it is the case of this example, the program which has ID of "a stock market (STOCK MARKET)" to the program information PG or the program sub information SB will be searched as an item ID of an item class "a category." And the retrieval section 114 tells the indicative-data generation section 113 about the title (ID) of the program ID of the program found out by search, its broadcast start time, broadcast end time, a program title (ID), a subtitle (ID) or a program sub ID, the broadcast start time of the division sub program, broadcast end time, and its division sub program etc. as the search result.

[0179] With those broadcasting hours, the indicative-data generation section 113 displays the program which changed text data into alphabetic character font data, and found it out from the information on this search result with reference to the list data corresponding to ID of the storage section 112, or a division sub program as a race card tbl according to item, as shown in drawing 18 C. In the case of the example of drawing, a broadcasting-hours display will be from broadcast start time and the time amount length of the program, and is displayed on it sequentially from the early thing of broadcast start time. Time amount length is computed as a difference of broadcast end time and broadcast start time.

[0180] In addition, when some with which broadcasting hours lap are in the program from which the retrieval section 114 was obtained by the retrieval result in consideration of the case where there is a program with which a broadcast time zone laps in the case of this example, information, such as a flag which shows the lap of broadcasting hours to that program, is sent to the indicative-data generation section 113. About the program with which broadcasting hours have lapped, the indicative-data generation section 113 changes those foreground colors, or indicates that it attaches shading and an underline etc., and he is trying to call attention of broadcasting hours having lapped with a user based on the information on the lap of these broadcasting hours. In the example of a display of drawing 18 C, the program with which broadcasting hours lap is surrounded by the dotted line, and is performing the nudge display.

[0181] Drawing 19 is the example of the screen display of other examples of retrieval. This example is a case as the initial retrieval menu M4 based on item class list data shows drawing 19 A, and is the case where an item class "a performer (ARTIST)" is chosen by the user as a search key, in this initial retrieval menu M4.

[0182] In the case of this example, since the list data corresponding to performer ID are contained as list data corresponding to ID of the index data in a broadcast signal, as shown in drawing 19 B, as a menu M5, the performer chart which changed the text data of that performer ID list data into the alphabetic character is displayed.

[0183] And in this menu M5, if in the case of a specific item and this example it is chosen by the user as a specific performer name attaches and shows a slash by drawing 19 B, the program on which the performer concerned appears about the program information on memory 111 by the retrieval section 114, the program it is broadcast that the musical piece performed by the performer concerned is, or a division sub program will be searched by using that performer ID as a search key. And the race card tbl according to item which serves as a title of the found-out program or a division sub program or a subtitle from the broadcast start time and broadcasting-hours length is displayed on screen 75D of a display 75, as shown in drawing 19 C. In addition, drawing 19 C is the example as which the music name was displayed as an example of the title name of for example, a division sub program. [0184] although the user specified as a retrieval item key in the case of the above example -- Mika and others -- it can obtain the race card tbl according to item, the race card of the performance music unit by the player can be displayed on a screen like the example of drawing 19 it not only can display the program of the category which wishes viewing and listening in 1 screen, and the program on which the player who wants to view and listen appears, but, and it is dramatically convenient. That is, the race card of the program element unit which constitutes a program can be created and displayed.

[0185] In this case, since the information on broadcast start time and broadcast end time is included not only per program unit but per division factice, the information on broadcasting hours can be displayed also not per one program unit but per division sub program (program element).

[0186] And the race card tbl according to item as which the program or program element of this retrieval result was displayed can be used, and it can reserve so that 1 of programs [ them ], program element, two or more selected programs and the selected program element, or all the programs and program elements of a race card may be recorded on videotape or recorded in the record regenerative-apparatus section 200.

[0187] That is, a user performs program reservation actuation in the joy stick carbon button 93 of a remote commander 90, the reservation carbon button 97, and the race card tbl according to item which operates a function button 92 further and is displayed on screen 75D like the case of the example using the program schedule TBL of drawing 15 mentioned above.

[0188] Then, the information on the race card tbl according to item of the program which was reserved besides the information on the channel of a reservation program in the case of this example is memorized by the program reservation memory 115. And although record actuation about the program and program element which were reserved is performed completely like the above-mentioned example, in the case of this example, the text data part displayed on the race card tbl according to item is recorded by UTOC of a disk 201 as data relevant to the reservation program and

program element which were each recorded.

[0189] Next, drawing 20 is the flow chart of processing in the system-control section 100 in the case of the program retrieval explained above and program reservation, and explains processing actuation about this flow chart hereafter.

[0190] If retrieval and program reservation are specified, since that remote-control signal will be received in remote control reception / decoding section 83 and it will notify to the system-control section 100 with a remote commander 90, in the case of this example, the system-control section 100 issues the acquisition request of the packet 23 of the program schedule information on the index data of an index channel, and the list data packet 24 corresponding to ID to the program selector 72, and memorizes this list data packet 24 corresponding to ID in reception and memory (step S1).

[0191] And the system-control section 100 extracts the item class list data 32 of this packet 24, it creates the initial retrieval menu M4 shown in drawing 18 and drawing 19, and screen 75D of a display 75 is made to display it on Video RAM 106 according to the program in ROM103 with the fixed data (an image data, font data, etc.) similarly memorized in ROM103 (step S2).

[0192] As mentioned above, a user operates a remote commander 90, looking at this initial retrieval menu M4. It judges whether it is decision actuation of the retrieval item which chose whether it was selection actuation of a retrieval item in which detect the actuation input of this remote commander 90, and it serves as a search key, and whether the system-control section 100 is actuation of the cancellation carbon button 98 (step S3).

[0193] If it is selection actuation of a retrieval item, detection and its selection display (the monochrome inverse video, modification of a foreground color, or display with pointer cursor) of the selections will be performed (step S4). Moreover, if it is actuation of the cancellation carbon button 98, it will fly to step S15, a menu display will be eliminated, and processing will be ended.

[0194] And when [ in step S3 ] it is decision actuation as a result of decision, the item used as a search key is determined (step S5), the table corresponding to item ID of the list data corresponding to ID memorized in memory is read, and the menu ( drawing 18 and menu M5 reference of drawing 19 ) of a subject name is displayed (step S6).

[0195] Since a user operates a remote commander 90, looking at the menu of this subject name, it judges whether it is decision actuation of an item in which detected the actuation input of this remote commander 90, and it chose whether it was selection actuation of an item, and whether the system-control section 100 is actuation of the cancellation carbon button 98 (step S7).

[0196] If it is selection actuation of an item, detection and its selection display (the monochrome inverse video, modification of a foreground color, or display with pointer cursor) of the selections will be performed (step S8). Moreover, if it is actuation of

the cancellation carbon button 98, it will fly to step S15, a menu display will be eliminated, and processing will be ended.

[0197] And the program schedule information which determined the selected item (step S9) and was memorized in memory by using ID of this item as a search key when [ in step S7 ] it was decision actuation as a result of decision is searched, and it is the program for reservation of that search result (a division sub program is included.). A below the same list (refer to race card tbl classified by item of drawing 18 and drawing 19 ) is displayed (step S10).

[0198] Since alter operation of the user is carried out for program reservation, looking at the list menu of the program for reservation on this screen 75D with a remote commander 90, it judges whether it is decision actuation of a reservation program in which detected the actuation input of this remote commander 90, and it chose whether it was selection actuation of a reservation program, and whether the system-control section 100 is actuation of the cancellation carbon button 98 (step S11).

[0199] If it is selection actuation of a reservation program, detection and its selection display (the monochrome inverse video, modification of a foreground color, or display with pointer cursor) of the selection program will be performed (step S12). Moreover, if it is actuation of the cancellation carbon button 98, it will fly to step S15, a menu display will be eliminated, and processing will be ended.

[0200] And when [ in step S11 ] it is decision actuation as a result of decision, the selected reservation program is determined (step S13), and information for reservation record etc. to carry out the program is registered into memory (step S14). And it progresses to the following step S15, a menu display is eliminated, and processing is ended.

[0201] In addition, after carrying out program reservation, a possibility that the broadcasting hours of the reserved program may be changed by modification of a program etc. may be. In this example, even if broadcasting hours are changed into the reservation program information registered into memory as follows by including the program title, the reserved program is recordable.

[0202] That is, it checks whether the program to which the program title of the program attached information on the specified channel that it is broadcast at that time is compared with the program title of the reservation program registered into memory, and broadcast is carried out at the event of the broadcast start time which the reserved program registered is a reserved program. And when the reserved program and a different program are broadcast, broadcasting hours are again checked using the program schedule information on the channel concerned, or the program schedule information on an index channel. And when broadcasting hours are changed into subsequent time amount, the broadcast start time and broadcast end time of a program which were reserved are changed into them in said program schedule information, and updating registration is carried out at memory.

[0203] If it does in this way, the broadcast time of day of the reserved program is

changed, and when it is behind and is broadcast, the reserved program concerned can be received certainly or it can record.

[0204] According to the approach of program retrieval which was explained above, only a specific player and a singer's musical piece can be extracted from a program, and it can record on a disk. Moreover, all specific programs, such as stock quotations, can be recorded on the same disk, and it is convenient. Moreover, when programs, such as an electronic newspaper, are broadcast at night, the timed recording of the program is made on the disk, and it is also possible to make it view and listen using the equipment which plays the disk in the middle of suitable time amount, for example, commutation.

[0205] Moreover, as information on UTOC of a disk, since he is trying to record the information about recorder files, such as a program title, it becomes possible using the information on this UTOC to reproduce the aforementioned stock quotations not from the order of record but from new information to a reverse order.

[0206] That is, with mini disc equipment, disk playback is usually performed sequentially from the old thing of record time according to the information on UTOC. However, playback in the sequence which the user specified is attained by making it make it reproduce, a user specifying the playback sequence of each record program, and referring to the information on UTOC according to the assignment. The receiving set of this example has the mode of the sequence rearrangement playback which enables playback in the sequence which this user specified.

[0207] Drawing 21 is the flow chart of processing of the system-control section 100 at the time of this sequence rearrangement playback mode.

[0208] The program will be started, if a user operates a remote commander 90 and chooses sequence rearrangement playback from a functional menu. And the data of UTOC are first read from a mini disc 201 (step S21). Based on this read UTOC information, the system-control section 100 generates the indicative data of the information about the content of record of a disk 201, and supplies and displays it on CRT display 75 through the graphic display processing section 74 (step S22).

[0209] For example, in the example of drawing 18 mentioned above, when the program which attached O mark of the race cards tbl according to item of drawing 18 C is reserved and all are recorded on a disk, as shown in drawing 22 A, as information about the content of record created based on the UTOC information, a list indication of the title of each program and the information about broadcasting hours is given. Moreover, as information about the content of record created based on the UTOC information, when the program which attached O mark of the race cards tbl according to item of drawing 19 C in the case of the example of drawing 19 is reserved and all are recorded on a disk, as shown in drawing 22 B, a list indication of the subtitle of each program, for example, a music name, and the information about the broadcasting hours (time amount length) is given.

[0210] A user chooses a program and music to reproduce using the joy stick carbon

button 93 of a remote commander 90 as that order to reproduce with pointer cursor in two or more programs or music by which it was indicated by the list, and performs decision actuation to this screen 75D. For this reason, as for a system control, the remote control signal from a remote commander 90 judges which actuation it is (step S23).

[0211] If it is selection actuation of a program to reproduce, while performing detection and its selection display (the monochrome inverse video, modification of a foreground color, or display with pointer cursor) of the selection program, the figure of the selected sequence is displayed on the side of the character representation of each program or music, as shown in drawing 22 A (step S24). If a remote control signal is based on actuation of the cancellation carbon button 98, it will fly to step S27, will eliminate a UTOC display, and will end processing.

[0212] And when [ in step S23 ] it is decision actuation as a result of decision, after eliminating a UTOC display (step S25), while supplying the playback program or playback music which carried out selection setting out, and the information on the sequence, the control signal which changes the record regenerative-apparatus section 200 into a playback condition is sent to the record regenerative-apparatus section 200 (step S26). The record regenerative-apparatus section 200 remembers the assignment information on the sequence to be the selected program or the selected music to the work piece RAM of the system-control section 210, and performs playback based on this. Consequently, the record regenerative-apparatus section 200 is the specified sequence, and reproduces only the selected program or the selected music.

[0213] Since the receiving set of this example has the above rearrangement playback modes, some conditions are rough searched as a search key, all are recorded on the disk, and it can perform easily reproducing in the sequence which took out and specified the required thing among that recorded file later.

[0214] In addition, although the above example is the case where the record regenerative-apparatus section 200 is the optical-magnetic disc equipment of a mini disc response, the record regenerative apparatus of the optical disk called so-called WO (Write Once) and MO can also be used for it.

[0215] Moreover, not an optical disk but a magnetic disk and the record regenerative apparatus using the magnetic tape as a record medium can also be used as the record regenerative-apparatus section 200.

[0216] Moreover, although the example in the case of satellite broadcasting service was explained, also in the broadcast transmitted by the cable, of course, a digital broadcast wave is applicable. Moreover, it is the case of analog television broadcasting like before, for example, this invention can be applied, also when carrying out multiplex [ of program schedule information and the list data corresponding to ID ] and broadcasting them at the level section of the opening of the vertical blanking period of a television signal in the same mode for example, as an alphabetic character

multiple signal. Furthermore, not only television broadcasting but in the case of a radio broadcasting, this invention is applicable.

[0217] Moreover, a remote commander may be a mouse-like thing is not restricted to a thing like an above-mentioned example, and displays a manual operation button on a screen in the shape of an icon, for example, it is made to direct it with pointer cursor.

[0218] Moreover, although the case where it specified and searched one item at a time, respectively was explained when program retrieval was performed, it is also possible to set up two or more retrieval conditions simultaneously, and to search them. Moreover, more detailed retrieval can be performed now in a short time by making it search by two or more ORs and ANDs of retrieval conditions.

[0219] Moreover, although timed recording, reservation sound recording, etc. were made to carry out reservation record of the program which carried out program retrieval in the above example, it is also good to enable it to only view and listen to the reserved program. Moreover, the displays of a receiving set may be not a CRT display but a liquid crystal display, and other displays.

[0220]

[Effect of the Invention] Since according to the program information broadcasting format by this invention what expressed with ID a provisions-of-classification class, its thin item, etc. of each program which constitutes program schedule information, and the list data corresponding to ID are included in a broadcast signal and broadcast as explained above, the amount of data can be lessened compared with the case where all the program schedule information is constituted from direct indicative datas, such as text data.

[0221] And since the list data corresponding to ID are sent together, it is not necessary to determine uniquely a response with each ID, and a provisions-of-classification class and its thin item, and can broadcast to program schedule information reflecting the program information according to the occasional various content of a program. For example, like a performer or a player, there are many the absolute numbers, and moreover, even if it is the case where there is a new entrant etc., it can respond easily by performing modification, addition, and deletion, making ID list data suitable and broadcasting them.

[0222] Moreover, the program schedule of the program element unit used as the search key can also be easily created by using ID used as classification information as a search key, and searching program schedule information.

[0223] And since not only broadcast start time but the information about broadcast end time is included in program schedule information, even if it is not the race card format which makes a longitudinal direction time amount shaft orientation, for example, and uses a lengthwise direction as a channel (broadcasting station), the broadcasting hours of each program unit can be known. For example, a broadcast schedule program can be searched by the ability using a specific program category as a search key, and the race card which displays the program found out as a result of retrieval on order

from the early thing of broadcasting hours with the information about each broadcast start time and broadcast end time, such as broadcast end time or broadcasting-hours length, can be created.

[0224] Moreover, the item which serves as a program element which constitutes each program according to this invention, for example, a performer etc., is used as a search key, and program retrieval can be carried out and it is possible to create and display the program schedule which consists only of a program on which the specific singer whose user specified appears, for example.

[0225] Furthermore, since he is trying to also broadcast the information about the broadcast start time and broadcast end time in an element unit which constitute each program according to this invention, the program schedule in not 1 program unit but a program element unit can be displayed. That is, for example, in the program only for music, the broadcast schedule of each musical piece unit can be known. And in this way, since the information on a broadcast schedule in each program element unit is included in program schedule information, a program element unit, for example, the partial program schedule which extracted the part of the program on which a specific singer appears, can be displayed.

[0226] Moreover, the receiving set by this invention can be equipped with the record regenerative-apparatus section, can carry out reservation assignment of the program searched by program retrieval, and can perform reservation record. In this case, since a program can be searched according to provisions of classification in the case of retrieval even if it does not know the information on broadcasting hours, compared with the case where reservation setting out of the broadcast time of day of a program is carried out like before, reservation actuation becomes very easy.

[0227] Moreover, it is possible to change playback sequence with record sequence using the information on this another area in record media, such as a disk, since the content of record data is recorded on area other than a main record data area like the UTOC area of a disk. Moreover, out of two or more recorded programs, only the program for which it wishes can be chosen and it can also reproduce.

---

## DESCRIPTION OF DRAWINGS

---

[Brief Description of the Drawings]

[Drawing 1] It is drawing for explaining the broadcast signal by one example of the program information broadcasting format by this invention.

[Drawing 2] It is drawing showing the example of the program schedule tabular data broadcast as a part of broadcast signal of the example of drawing 1.

[Drawing 3] It is drawing showing the list data of the program provisions-of-

classification class broadcast as a part of broadcast signal of the example of drawing 1 .

[Drawing 4] It is drawing showing the example of the list data corresponding to ID broadcast as a part of broadcast signal of the example of drawing 1 .

[Drawing 5] It is drawing showing the example of the list data corresponding to ID broadcast as a part of broadcast signal of the example of drawing 1 .

[Drawing 6] It is drawing showing the example of the list data corresponding to ID broadcast as a part of broadcast signal of the example of drawing 1 .

[Drawing 7] It is drawing showing the example of the list data corresponding to ID broadcast as a part of broadcast signal of the example of drawing 1 .

[Drawing 8] It is drawing showing the example of the list data corresponding to ID broadcast as a part of broadcast signal of the example of drawing 1 .

[Drawing 9] It is drawing for explaining the appearance of one example of the receiving set by this invention.

[Drawing 10] It is the block diagram of one example of the receiving set by this invention.

[Drawing 11] It is the block diagram of the example of the record regenerative-apparatus section of built-in in the one example of the receiving set by this invention.

[Drawing 12] It is drawing for explaining the record data of the disk by which record playback is carried out in the record regenerative-apparatus section of built-in in the one example of the receiving set by this invention.

[Drawing 13] It is drawing showing the example of the remote commander used for one example of the receiving set by this invention.

[Drawing 14] It is a functional block diagram for the program retrieval in one example of the receiving set by this invention, and reservation record.

[Drawing 15] It is drawing showing an example of the program schedule displayed on the display of one example of the receiving set by this invention.

[Drawing 16] It is drawing showing the example of a display of the display in the case of the program retrieval in one example of the receiving set by this invention.

[Drawing 17] It is drawing showing the example of a display of the display in the case of the program retrieval in one example of the receiving set by this invention.

[Drawing 18] It is drawing showing other examples of a display of the display in the case of the program retrieval in one example of the receiving set by this invention.

[Drawing 19] It is drawing showing other examples of a display of the display in the case of the program retrieval in one example of the receiving set by this invention.

[Drawing 20] It is drawing showing the flow chart of an example of the program retrieval and program reservation processing in one example of the receiving set by this invention.

[Drawing 21] It is drawing showing the flow chart of an example of processing of the special playback mode of the record regenerative-apparatus section in one example of the receiving set by this invention.

[Drawing 22] It is drawing showing the example which reproduced the information about the content of record recorded on the record medium used in the record regenerative-apparatus section in one example of the receiving set by this invention, and was displayed on the display.

[Description of Notations]

23 Program Schedule Information Packet

24 List Data Packet corresponding to ID

32 Item Class List Data

33-36 Various kinds of list data corresponding to ID

37 ID Code

38 Response Text Data

51 Program ID

53 62 Broadcast initiation time information

54 63 Broadcast termination time information

55 64 Information on an item class

56 65 Item ID

70 Receiving Set

71 Satellite Broadcasting Service Antenna

75 Display

90 Remote Commander

93 Joy Stick Carbon Button

94 Menu Button

95 Retrieval Carbon Button

97 Reservation Carbon Button

100 System-Control Section

108 Timer

110 Control Section

111 Program Information Records Department

112 List Data Storage Section corresponding to ID

113 Indicative-Data Generation Section

114 Retrieval Section

115 Program Reservation Memory

116 Reservation Activation Section

200 Record Regenerative-Apparatus Section

201 Magneto-optic Disk

PG Program information

SB Program sub information

TBL Program schedule

tbl Race card according to item

M1-M5 Program menu